

NEW TAXA IN *THELESPERMA* AND *TOWNSENDIA* (COMPOSITAE) FROM UTAH

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ABSTRACT. — Three new taxa are named and described: *Thelesperma subnudum* Gray var. *alpinum* Welsh, *Townsendia jonesii* (Beaman) Reveal var. *lutea* Welsh, and *Townsendia montana* var. *caelilimensis* Welsh.

Preparation of a manuscript of the sunflower family for the Utah flora project demonstrated the existence of diversity within *Thelesperma* and *Townsendia* that seems best treated at taxonomic rank within existing species in those genera. In both genera the plants named are ecological specialists, with plants of each taxon occurring on calciferous or gypsiferous substrates of the Carmel, Flagstaff, Arapien, or other peculiar formations. Each of them belongs to the mound-forming group of substrate specialists of barren or semibarren habitats where water relations are controlled by the parent material. Generally the habitats are arid, despite the large amount of rainfall in the higher elevation sites. In all habitat examples cited there are other similarly restricted specialists, either species or varieties.

Thelesperma subnudum Gray var. *alpinum* Welsh, var. nov. Similis *Thelesperma subnudo* Gray var. *subnudo* sed in habitu humilioribus et capitulis parvioribus differt.

Perennial herbs from a taproot and less commonly with a caudex and creeping rootstock; stems 3–7 cm tall, subscapose; leaves mainly basal on the stem, 1.5–4 cm long, pinnately lobed, or the upper entire; petioles ciliate and the blades puberulent; involucre 6.3–9 mm high, 9–14 mm wide; outer bracts oblong to lanceolate, with narrow scarious margins, to half as long as the inner; inner bracts united to below the middle; rays lacking; disk flowers yellow; pappus a toothed crown; achenes glabrous or hairy apically.

TYPE.— USA. Utah. Wayne County, T28S, R4E, S13 (NE¼), 3 mi due N of Bicknell, bristlecone pine forest on multicolored clay hills, 2745 m, 20 July 1980, D. Atwood and

B. Thompson 7646a (Holotype BRY). Additional specimen: Utah. Wayne County, S of Teasdale, 25 July 1978, D. Atwood 6924 (BRY).

This dwarf phase of *Thelesperma subnudum* occurs about 500 m above the uppermost elevations known for the typical variety. Discoid plants are not uncommon for the widespread phase of the species, including at least a portion of the type (taken in Red Canyon, near Paragonah; isotype BRY), but the typical phase is ordinarily radiate. The dwarf alpine plants have involucre that are both shorter and narrower on the average. The plants are apparently restricted to the Carmel Limestone, on the peculiar varicolored phase of that formation as it occurs at the east margin of Rabbit Valley.

Townsendia jonesii (Beaman) Reveal var. *lutea* Welsh, var. nov. Affinis *T. jonesii* var. *jonesii* sed in corollis luteis ventralis differt et in substratis gypsiferis confinis.

Subcaulescent to acaulescent caespitose herbs, the caudex commonly branched; stems not conspicuously white-strigose, mainly 2–3 cm tall, forming clumps to 5 cm wide; leaves 10–30 mm long, 1–4 mm wide, oblanceolate to spatulate or almost linear, strigose; heads mostly solitary; involucre 9–12 mm high, 8–13 mm wide; bracts in 4 or 5 series, lanceolate, green or suffused purple, sparsely strigose; rays 13–21, yellow ventrally, often suffused reddish dorsally, glandular, 4–7 mm long; disk corollas yellow, ca 3.5 mm long; achenes 3–5 mm long, pubescent with glochidiate hairs; ray pappus 2–4.5 mm long; disk pappus 5–8 mm long.

TYPE.— USA. Utah. Sevier County, Arapien shale outcrop with scattered juniper, ca

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4.2 km E of Sigurd, T23S, R1W, S8, at milepost 14, Utah Hwy 24, 8 May 1975, S.L. Welsh 12700 (Holotype BRY; 2 isotypes distributed previously as *T. aprica* Welsh & Reveal).

Additional specimens: Utah. Sevier County, Rainbow Hills area, 2 mi NE of Glenwood, 7 May 1981, L. Greenwood 5013; do, 4 mi S of Salina, 24 Mar. 1981, L. Greenwood 5003; do, 2 mi E of Sigurd, 7 May 1981, L. Greenwood 5012. Piute County, NE side of Piute Reservoir, 26 Apr. 1979, E. Neese et al. 7149; do 30 Apr. 1981, D. Atwood and E. Neese 7794 (all BRY).

The presence of yellow flowers in *T. aprica* was considered to be noteworthy for the genus, although corollas that dried yellowish were admitted for *T. jonesii* (Reveal 1970). The existence of populations with yellow corollas when fresh in Piute and western Sevier counties at first indicated placement of those plants with *T. aprica*, but the long pappus of the ray flowers indicates relationships with *T. jonesii*, in which the corollas sometimes fade yellowish.

Most of the localities for this variety are situated on the Arapien Shale, which is noted for its deposits of commercial gypsum. The exception involves those plants from near the Piute Reservoir in Piute County, where the plants grow on gypsiferous or calciferous substrates amidst igneous gravels.

Townsendia montana Nutt. var. *caelilimensis* Welsh, var. nov. A var. *montana* differt in foliis spatulatis late capitulis majoribus et bracteis latioribus.

TYPE:—USA. Utah. Sanpete Co., T20S, R4E, S33, ca 24 km W of Ferron, 3050 m, Flagstaff Limestone, barrens, 13 July 1977, S. Welsh & S. Clark 15385 (Holotype BRY; 3

isotypes distributed previously as *T. montana* Nutt.). Additional specimens: Utah. Duchesne County, Argyle Canyon, 27 June 1978, E. Neese & L. England 5864; do, T6S, R6W, SW of Duchesne, 2 June 1978, E. Neese 5305. Sanpete County, 8 mi E of Spring City, 12 July 1977, E. Neese & S. White 3552; Heliotrope Mountain, 26 June 1977, M.E. Lewis 4254; do, 17 July 1981, D. Atwood 7998; do, head of Bacon Rind Canyon, J. W. Humphrey 52958, 22 July 1927; do, 11 mi 134 degrees from Manti, 3 July 1981, 22 July 1927; South Tent Mountain, 27 July 1976, M. E. Lewis 4365; Skyline at head of Duck Fork, 22 July 1976, M. E. Lewis 4246; do, E of Manti, 28 July 1977, S. Clark 2877. Wasatch County, 27 mi 98 degrees east of Spanish Fork, 19 July 1982, S. Goodrich 17303 (all BRY).

This is the large-headed phase of the species, with broadly rounded spatulate leaves, which lies intermediate with the typical montane materials and the dwarf plants of var. *minima*. The broad leaves and large heads are diagnostic in segregation of this entity from both the typical montane phase and the more southern var. *minima*.

The substrate occupied by var. *caelilimensis* on the Wasatch Plateau is composed of weathered Flagstaff Limestone. The Duchesne County populations occur on calciferous members of the Green River Formation.

LITERATURE CITED

- BEAMAN, J. H. 1957. The systematics and evolution of *Townsendia* Compositae. Contr. Gray Herb. 183: 1-151.
- REVEAL, J. L. 1970. A revision of the Utah species of *Townsendia* (Compositae). Great Basin Nat. 30:23-52.